Listed below is a clean copy of amended claims. A marked-up copy of the amended claims is provided in an accompanying document.

2193. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters disposed in the formation to at least a portion of the formation such that an average heating rate of the part of the formation is less than about 1 °C per day in a pyrolysis temperature range; and

allowing the heat to transfer from the one or more heaters to a part of the formation such that a permeability of at least a portion of the part of the formation increases to greater than about 100 millidarcy.

2194. (amended) The method of claim 2193, wherein the one or more heaters comprise at least two heaters, and wherein controlled superposition of heat from at least the two heaters pyrolyzes at least some hydrocarbons within the part of the formation.

2195. (amended) The method of claim 2193, further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range of about 270 °C to about 400 °C.

2202. (amended) The method of claim 2193, wherein providing heat from one or more of the heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from one or more of the heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate (h) of the selected volume is about 10 °C/day.

2204. (amended) The method of claim 2193, wherein providing heat from one or more of the heaters increases a thermal conductivity of at least a portion of the part of the formation to

~~greater than about 0.5 W/(m °C).~~

2216. (amended) The method of claim 2193, further comprising producing a mixture from the formation, wherein the produced mixture comprises a non-condensable component at 25 °C and one atmosphere absolute pressure, wherein the non-condensable component comprises molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable component, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable component.

2227. (amended) The method of claim 2193, wherein allowing the heat to transfer increases a permeability of a majority of the part of the formation such that the permeability of the majority of the part of the formation is substantially uniform.

2232. ~~(amended)~~ A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters disposed in the formation to at least a portion of the formation such that an average heating rate of the part of the formation is less than about 1 °C per day in a pyrolysis temperature range; and

allowing the heat to transfer from the one or more heaters to a part of the formation such that a permeability of a majority of at least a portion of the part of the formation increases and such permeability is substantially uniform.

2233. (amended) The method of claim 2232, wherein the one or more heaters comprise at least two heaters, and wherein controlled superposition of heat from at least the two heaters pyrolyzes at least some hydrocarbons within the part of the formation.

2234. (amended) The method of claim 2232, further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range of about 270 °C to about 400 °C.

2241. (amended) The method of claim 2232, wherein providing heat from one or more of the heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from one or more of the heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate (h) of the selected volume is about 10 °C/day.

2243. (amended) The method of claim 2232, wherein providing heat from one or more of the heaters increases a thermal conductivity of at least a portion of the part of the formation to greater than about 0.5 W/(m °C).

2255. (amended) The method of claim 2232, further comprising producing a mixture from the formation, wherein the produced mixture comprises a non-condensable component at 25 °C and one atmosphere absolute pressure, wherein the non-condensable component comprises molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable component, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable component.

2264. (amended) The method of claim 2232, further comprising:

producing hydrogen (H_2) and condensable hydrocarbons from the formation; and

hydrogenating a portion of the produced condensable hydrocarbons with at least a portion of the produced hydrogen.

2265. (amended) The method of claim 2232, wherein allowing the heat to transfer increases a permeability of a majority of the part of the formation to greater than about 100 millidarcy.

5399. (amended) The method of claim 2193, wherein a pyrolysis zone is established in the part of the formation.